



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/049,969	02/13/2002	Michael Zimmermann	70301/56944	6228
21874	7590	10/03/2003	EXAMINER	
EDWARDS & ANGELL, LLP P.O. BOX 9169 BOSTON, MA 02209			BERMAN, SUSAN W	
			ART UNIT	PAPER NUMBER

1711

DATE MAILED: 10/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/049,969

Applicant(s)

ZIMMERMANN ET AL.

Examiner

Susan W Berman

Art Unit

1711

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 23-65 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 23-65 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Response to Amendment

Claims 23-62 submitted 07-13-2002 in the Preliminary Amendment have been renumbered claims 26-65. Claims 1-22 have been canceled in the Preliminary Amendment. Original claims 23-25 remain in the application.

Specification

The disclosure is objected to because of the following informalities: On page 1 of the specification, paragraphs 5 and 6 refer to claim numbers. Since the claim numbers and/or subject matter set forth in the claims is subject to change, the claim numbers should be replaced with the subject matter applicant is referring to.

Appropriate correction is required.

Information Disclosure Statement

EP 0 897 710 and DE 197 53 322 have not been considered because the documents are not in English and no Abstract nor translation was provided.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 23-65 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 23-25 are indefinite because the claims depend from canceled claims.

Claim 26: it is not clear what is meant by the phrase "positions corresponding to the cross-section of the object". What is the cross section of the object? What positions correspond to a cross section? What

Art Unit: 1711

is meant by “irradiating in each layer of a composition comprising...”? What layers are in the composition?

Claims 26 and 45: In the definition of (a) the phrase “compound comprising a group selected from ... group” renders the claim indefinite. It is suggested that applicant employ proper Markush language, such as “compound selected from the group consisting of an acrylate compound,... and a methacryl-epoxy oligomeric compound”.

Claim 45: It is not clear what is meant by “at positions corresponding to the cross-section of the filling in the particular layer” or by “solidifying in each layer a composition”.

Claims 29 and 50: It is not clear what is meant by “which can be hardened...or one which is self-hardening”. What is referred to by “one”? It is suggested that applicant delete the word “one”. The claim language is indefinite because the recitation “can be obtained” does not clearly state whether the polysiloxanes are obtained by hydrolytic condensation ... or not. See the description of polymerizable polysiloxanes as set forth on page 5 in the specification.

Claim 30: this claim recites the method “according to claim 30”, thus it is not clear which method claim applicant intends to refer to.

Claims 31 and 52: The use of the phrase “general formula” renders the claims indefinite because it is not clear whether applicant intends to set forth the formula shown or some other formula of the same general type. R_2 is defined in the claims but is not found in the formula. See the structure set forth on page 7 in the specification.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

Art Unit: 1711

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Instant claim 26 recites a method comprising irradiating "in each layer of a composition comprising...". It is believed that applicant intends to claim a method of applying several layers of the recited composition and irradiating each layer sequentially before applying the next layer, however, the claim language, as written, does not recite the steps required for "sequential selective solidification of layers of composition".

Claims 23, 25-27, 32-39, 44, 45, 53-60 and 65 are rejected under 35 U.S.C. 102(b) as being anticipated by Wolf et al (5,461,088). Wolf et al disclose radiation curable formulations for use in stereolithography comprising compounds with free radically polymerizable groups and a photoinitiator. The method steps for stereolithography are taught in column 10, lines 14-67. Wolf et al teach that it is preferred to produce three-dimensional objects (column 10, lines 63-67). Thus the disclosed process would be expected to produce an object suitable for a tooth filling, in the absence of evidence to the contrary. The polysiloxanes disclosed do not appear to be polymerizable polysiloxanes.

Claims 23, 25-27, 32-37, 43-48, 53-58, 64 and 65 are rejected under 35 U.S.C. 102(e) as being anticipated by Lapin et al (6,251,557). Lapin et al disclose a method for manufacture of 3-dimensional objects using a photosensitive resin composition for rapid prototyping. See the Abstract, column 2, line 41, to column 3, line 3, the resins and photoinitiators and additives taught in columns 3-8.

Art Unit: 1711

Claims 23, 25-27, 32-36, 40, 44, 45, 47, 53-57, 61 and 65 are rejected under 35 U.S.C. 102(e) as being anticipated by Halloran et al (6,117,612). Halloran et al disclose multi-layer fabrication of green parts by stereolithography and photocurable ceramic resins having high solids loading. See column 5, lines 19-24, column 5, line 56, to column 6, line 65, and the Examples.

Claims 23-27, 32-37, 40-42, 44, 45, 47, 53-58, 61-63 and 65 are rejected under 35 U.S.C. 102(e) as being anticipated by Tamura et al (6,200,732, filed 04-1997). Tamura et al disclose an optical stereolithographic method for forming an object and compositions therefor. The disclosed compositions comprise solid fine particles or whiskers as filler material. See column 9, lines 33-62, column 10-12 and column 17, lines 15-51.

Claims 23, 25-27, 32-37, 40, 42, 44, 45, 47, 53-58, 61, 63 and 65 are rejected under 35 U.S.C. 102(e) as being anticipated by Narusawa et al (6,033,223, filed 09-18-1997). Narusawa et al teach a method of polymerizing a dental composition by initiating polymerization by irradiation of a dental composite in a dental cavity progressively from a portion adjacent to the bottom of the cavity towards a surface portion. Photopolymerizable materials and initiators are taught in columns 9-10.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 1711

Claims 23-28, 31-38, 40, 42-45, 47, 49, 52-59, 61 and 63-65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Narusawa et al (6,033,223, filed 09-18-1997) in view of Hanke (5,112,884). The disclosure of Narusawa et al is discussed above. Narusawa et al teach adding filler materials, such as silicone dioxide in the form of quartz, quartz glass or silica gel, to the dental compositions. Hanke discloses ormocer or ormosil dental filling materials having the structural formula set forth in instant claims 31 and 52 and photoinitiators for the compositions. See column 1, lines 21-54.

It would have been obvious to one skilled in the art to employ the ormocer or ormosil dental filling material taught by Hanke as the dental filler in the composition and method disclosed by Narusawa et al. Narusawa et al provide motivation by teaching addition of fillers including various inorganic, organic or inorganic and organic composite filler materials and suggesting silicone dioxide materials specifically. Hanke provides motivation by teaching that the disclosed organically modified silica fillers provide outstanding polishability of composites and improved mechanical strength and abrasion resistance to fillings.

Claims 23-30, 32-38, 40, 42-45, 47, 49-51, 53-59, 61 and 63-65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Narusawa et al (6,033,223, filed 09-18-1997) in view of Soria et al (5,395,954). The disclosure of Narusawa et al is discussed above. Soria et al disclose ormocers for making composite structures, especially for obtaining products of complex shape (column 3, lines 58-68).

It would have been obvious to one skilled in the art to employ the ormocer or ormosil dental filling material taught by Sorai et al as the dental filler in the composition and method disclosed by Narusawa et al. Narusawa et al provide motivation by teaching addition of fillers including various inorganic, organic or inorganic and organic composite filler materials and suggesting silicone dioxide materials specifically. Soria et al provide motivation by teaching that the metal content of the disclosed ormocers provides improved chemical, thermal and mechanical properties (column 2, lines 3-22).

Claims 39 and 60 and 65 are rejected under 35 U.S.C. 103(a) as being obvious over Wolf et al (5,461,088), Lapin et al (6,251,557), or Narusawa et al (6,033,223, filed 09-18-1997) in view of Hanke (5,112,884), each further in view of Field et al. The disclosures of the primary references and of Hanke are discussed above. Each reference teaches adding a dye to the disclosed compositions. Field et al teach a method for indicating the cure point for ultraviolet radiation curing compositions comprising adding a dye, such as an anthraquinone dye. See column 2, lines 35-56. It would have been obvious to one skilled in the art to employ an anthraquinone dye to indicate the cure point of the radiation curable composition, as taught by Field et al, in the method disclosed by Wolf et al, Lapin et al or Narusawa et al in combination with Hanke. One skilled in the art at the time of the invention would have been motivated by a reasonable expectation of taking advantage of the visible indication of cure of the composition.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Burns (5,514,232) is cited as art of interest. Burns discloses a method and apparatus for automatic fabrication of three-dimensional objects from individual layers of fabrication material. The method uses a data representation of the desired 3-D object stored in the memory of a computer for fabricating each layer of the object (column 7, lines 10-20 and 44-60 and column 8, lines 20-34). See the method steps set forth in column 4. Fabrication materials such as ceramic powders in a polymer matrix and sol-gel derivatives such as ormosils and creamers can be used in the method (column 8, line 60, to column 9, line 5). Burns does not teach irradiating the composition to solidify each layer or mention dental materials.

Tamura et al (6,203,966 and 6,413,698) and Yamamura et al (6,287,745) are cited as art of interest.

Art Unit: 1711

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Susan W Berman whose telephone number is 703 308 0040. The examiner can normally be reached on M-F 9:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Seidleck can be reached on 703 308 2462. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 0661.



Susan W Berman
Primary Examiner
Art Unit 1711

SB
September 9, 2003